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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,620	08/01/2007	Koji Kawaguchi	062901	3827
38834 7590 08/13/2010 WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP 1250 CONNECTICUT AVENUE, NW SUITE 700 WASHINGTON, DC 20036				
EXAMINER JOHNSON, PHILLIP A				
ART UNIT 3656		PAPER NUMBER		
NOTIFICATION DATE 08/13/2010		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentmail@whda.com

# Office Action Summary

**Application No.**

10/589,620

**Applicant(s)**

KAWAGUCHI ET AL.

**Examiner**

PHILLIP A. JOHNSON

**Art Unit**

3656

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 June 2010.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 2 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1 and 2 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 16 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/GS/US)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Status of Claims***

The amendment filed on June 24, 2010 is acknowledged. Claims 1 and 2 are pending in this application.

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

**Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakagawa et al. (USP 6,086,261).**

Re claim 1, Nakagawa (Fig. 9) discloses an outer ring 1 having an outer ring raceway surface undergoing crowning, an inner ring 2 having an inner ring raceway surface undergoing crowning, and plural tapered rollers 3 having a rolling surface undergoing crowning, which are located as rolling universally between said outer 1 and inner 2 ring raceway surfaces.

Nakagawa does not expressly disclose the total crowning amount, defined as the sum of crowning amount of outer ring 1, the crowning amount of inner ring 2 and two times the crowning amount of the roller 3, is more than 50  $\mu\text{m}$ , and the crowning ratio of the outer ring 1, defined as crowning amount of outer ring 1 divided by the total crowning amount, is 40% or more, and the roller 3 crowning ratio, defined as two times the roller 3 crowning amount divided by the total crowning amount, is 20% or less.

Nakagawa does disclose that the crowning amount has an impact on roller settling, or running-in time prior to bearing preload, such that optimizing the crown amount can improve running-in time, thereby reducing the time to bearing preload (col. 12, lines 62 – 67 through col. 13, lines 1 – 18). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Nakagawa, such that the total crowning amount, defined as the sum of crowning amount of outer ring 1, the crowning amount of inner ring 2 and two times the crowning amount of the roller 3 times, is more than 50  $\mu\text{m}$ , and the crowning ratio of the outer ring 1, defined as crowning amount of outer ring 1 divided by the total crowning amount, is 40% or more, and the roller 3 crowning ratio, defined as two times the roller 3 crowning amount divided by the total crowning amount, is 20% or less, since it has been held that discovering optimum value of a result effective variable involves only routine skill in the art.

Re claim 2, Nakagawa (col. 13, lines 9 – 13) discloses the inner wheel crowning ratio, defined as crowning amount of the inner ring 2 (max. 20  $\mu\text{m}$ ) divided by the total crowning amount (max. 50  $\mu\text{m}$  for compound crowning), is 10% or more ( $20/50 = 0.40 > 0.10$ ).

### ***Response to Arguments***

Applicant's arguments filed June 24, 2010 have been fully considered but they are not persuasive.

The Applicant alleges, *"First, Nakagawa teaches away from (1) having a roller crowning ratio which is less than 20% and (2) a crowning ratio of an outer ring 1 that is 40% or more. For example, the roller crowning ratio is 23.1% (i.e.,  $12/52 = .231$ ) and the outer ring crowning ratio is 38.5% (i.e.,  $20/52 = .385$ ). See col. 13, lines 9-13. As such, Nakagawa teaches away from aspects (1) and (2) of the claimed invention.*

*The Examiner respectfully disagrees. Nakagawa discloses (col. 13, lines 9 – 17) that "the amount of crowning (the amount of drop) can be optionally set within the range of 1-6 .mu.m for the rolling surface 3c', 1-20 .mu.m for the raceway surface 1a', and 1-20 .mu.m for the raceway surface 2a' (10-50 .mu.m for compound crowning). Such arrangement ensures smooth axial movement of the tapered roller 3 toward the cone back face rib face 2c during the running-in operation and shortens the running-in operation time."* The above disclosure does not indicate any unexpected or negative results attributed by ranges that differ from the claimed ranges. Nakagawa merely treats the above ranges as optional ( *"optionally set"*) settings to achieve a desired performance. Thus, the claimed ranges would not be contrary to the teachings of Nakagawa.

The Applicant further alleges, *"the Examiner has not established that (1) the total crowning amount, defined as the sum of crowning amount of outer ring, the crowning amount of inner ring and two times the crowning amount of the roller, is more than 50  $\mu$ .m, (2) the crowning ratio of the outer ring, defined as crowning amount of outer ring divided by the total crowning amount, is 40% or more, and (3) the roller crowning ratio, defined as two times the roller crowning amount divided by the total crowning amount, is*

*20% or less, are result-effective variables." And further, "while Nakagawa recognizes that the amount of crowning can be optionally set (within ranges outside the claimed values), the Examiner has not pointed to any teaching in the cited reference, or provided any explanation based on scientific reasoning, that would support the conclusion that one skilled in the art would have considered it obvious to "optimize" the prior art structure by increasing the crowning ratio of the outer ring to 40% or more and decreasing the roller crowning ratio to 20% or less."*

However, it is clear from the aforementioned disclosure (col. 13, lines 9 - 17) that Nakagawa does not teach away from the claimed ranges of the total crowning amount, and clearly recognizes the total crowning amount as a result effective variable. Thus, the determination of an optimum or workable range of the total crowning amount would only involve routine skill in the art.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PHILLIP A. JOHNSON whose telephone number is (571) 270-5216. The examiner can normally be reached on MON - FRI, 7:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571) 272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PHILLIP A. JOHNSON/  
Examiner, Art Unit 3656

/Thomas R. Hannon/  
Primary Examiner, Art Unit 3656